IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Claims 1-10 (Canceled).

Claim 11. (Currently Amended) A manufacturing method of a semiconductor device comprising:

doping n-type impurity ions into a selected portion of a surface region of a p-type silicon semiconductor region;

doping p-type impurity ions into the entire surface region of the silicon semiconductor region;

activating the n-type and p-type impurity ions to form an n-type diffusion region in the surface region of the silicon semiconductor region and form a p-type impurity diffusion layer in a depth direction of the silicon semiconductor region; and

performing heat treatment to form an Ni silicide film in the surface region of the n-type diffusion region after depositing Ni on the surface of the n-type diffusion region,

wherein the p-type impurity diffusion layer is formed after formation of the Ni silicide film to have an impurity profile in which a peak concentration of not lower than 1E20 cm^{-3} is provided in a preset depth position of the Ni silicide film and a concentration in an interface between the Ni silicide film and the n-type diffusion region and a concentration in a position deeper than the interface are not higher than 5E19 cm^{-3}~~, and the p-type ions are doped to provide a peak concentration in the Ni silicide film~~.

Claim 12 (Original): A manufacturing method of the semiconductor device according to claim 11, wherein one of B and BF_2 ions is doped as the p-type impurity.

Claim 13 (Original) A manufacturing method of the semiconductor device according to claim 11, wherein the p-type impurity ions are doped to provide a peak concentration in a position at a depth of 30 nm from the surface of the Ni silicide film.

Claim 14 (Original): A manufacturing method of the semiconductor device according to claim 11, further comprising:

forming a contact liner film on the entire surface after forming the Ni silicide film;

forming an inter-level insulating film on the entire surface;

forming opening portion which reaches the surface of the n-type diffusion region in the inter-level insulating film and contact liner film; and

forming an electrode in contact with the surface of the n-type diffusion region in the opening portion.

Claim 15 (Currently Amended): A manufacturing method of a semiconductor device comprising:

doping p-type impurity ions into an entire surface region of a p-type silicon semiconductor region;

doping n-type impurity ions into a selected position of the surface region of the silicon semiconductor region;

activating the p-type and n-type impurity ions to form a p-type impurity diffusion layer in a depth direction of the silicon semiconductor region and form an n-type diffusion region on the surface portion of the silicon semiconductor region; and

performing heat treatment to form an Ni silicide film on the surface region of the n-type diffusion region after depositing Ni on the surface of the n-type diffusion region,

wherein the p-type impurity diffusion layer is formed after formation of the Ni silicide film to have an impurity profile in which a peak concentration of not lower than 1E20 cm^{-3} is provided in a preset depth position of the Ni silicide film and a concentration in an interface between the Ni silicide film and the n-type diffusion region and a concentration in a position deeper than the interface are not higher than 5E19 cm^{-3}~~, and the p-type ions are doped to provide a peak concentration in the Ni silicide film~~.

Claim 16 (Original): A manufacturing method of the semiconductor device according to claim 15, wherein one of B and BF_2 ions is doped as the p-type impurity.

Claim 17 (Original): A manufacturing method of the semiconductor device according to claim 15, wherein the p-type impurity ions are doped to provide a peak concentration in a position at a depth of 30 nm from the surface of the Ni silicide film.

Claim 18 (Original): A manufacturing method of the semiconductor device according to claim 15, further comprising:

forming a contact liner film on the entire surface on the entire surface after forming the Ni silicide film;

forming an inter-level insulating film on the entire surface;

forming opening portion which reaches the surface of the n-type diffusion region in the inter-level insulating film and contact liner film; and

forming an electrode in contact with the surface of the n-type diffusion region in the opening portion.

Claim 19 (Currently Amended): A manufacturing method of a semiconductor device comprising:

doping n-type impurity ions into a selected position of a surface region of a p-type silicon semiconductor region;

activating the n-type impurity ions to form n-type diffusion region on the surface portion of the silicon semiconductor region;

doping p-type impurity ions into an entire surface portion of the silicon semiconductor region to form the surface portion of the silicon semiconductor region in an amorphous form;

activating the p-type impurity ions to form p-type diffusion region in a depth direction of the silicon semiconductor region; and

performing heat treatment to form an Ni silicide film on the surface region of the n-type diffusion region after depositing Ni on the surface of the n-type diffusion region,

wherein the p-type impurity diffusion layer is formed after formation of the Ni silicide film to have an impurity profile in which a peak concentration of not lower than 1E20 cm^{-3} is provided in a preset depth position of the Ni silicide film and a concentration in an interface between the Ni silicide film and the n-type diffusion region and a concentration in a position deeper than the interface are not higher than 5E19 cm^{-3}~~, and the p-type ions are doped to provide a peak concentration in the Ni silicide film~~.

Claim 20 (Original): A manufacturing method of the semiconductor device according to claim 19, wherein one of B and BF_2 ions is doped as the p-type impurity.

Claim 21 (Original): A manufacturing method of the semiconductor device according to claim 19, wherein the p-type impurity ions are doped to provide a peak concentration in a position at a depth of 30 nm from the surface of the Ni silicide film.

Claim 22 (Original): A manufacturing method of the semiconductor device according to claim 19, further comprising:

forming a contact liner film on the entire surface after forming the Ni silicide film;

forming an inter-level insulating film on the entire surface;

forming an opening portion which reaches the surface of the n-type diffusion region in the inter-level insulating film and the contact liner film; and

forming an electrode in contact with the surface of the n-type diffusion region in the opening portion.

Claim 23 (New): A manufacturing method of the semiconductor device according to claim 11, wherein the p-type ions are doped to provide a peak concentration in the Ni silicide film.

Claim 24 (New): A manufacturing method of the semiconductor device according to claim 15, wherein the p-type ions are doped to provide a peak concentration in the Ni silicide film.

Claim 25 (New): A manufacturing method of the semiconductor device according to claim 19, wherein the p-type ions are doped to provide a peak concentration in the Ni silicide film.